

# Pathways for Introduction & Prevention / Early Detection

Scott Oneto, University of California Coop Ext.





# Outline

- Pathways for introduction
  - Examples
- Characteristics that makes a plant invasive
- Horticulture Industry / Surveys
- Prevention
- Early detection

# Pathways of introduction

- Intentional
  - forage species
  - erosion control
  - ornamental
  - Food, fiber or medicinal uses

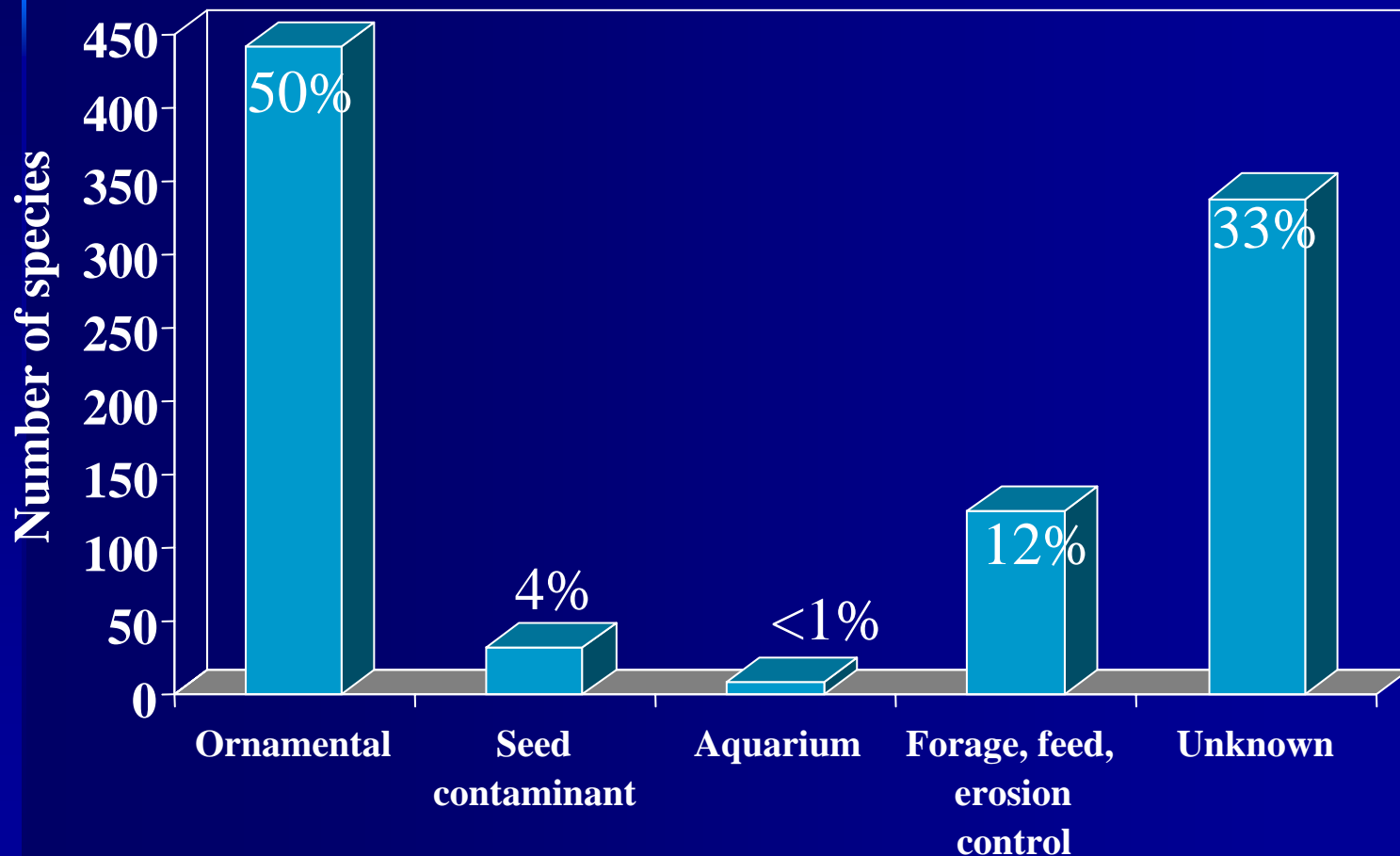


# Pathways of introduction

- Accidental
  - seed contaminants
  - hay and animal fodder
  - hitchhiker on clothing, equipment, animals



# Pathways of introduction into California



# Types of invasive plants

- Herbaceous

- annuals
- perennials
- parasitic
- epiphytic

- Woody

- trees
- shrubs
- vines

Yellow starthistle  
(*Centaurea solstitialis*)





French broom  
(*Genista monspessulana*)



Scotch broom  
(*Cytisus scoparius*)



Spanish broom  
(*Spartium juncum*)





Pampasgrass  
*Cortaderia selloana*



Jubatagrass  
*Cortaderia jubata*





Jubatagrass

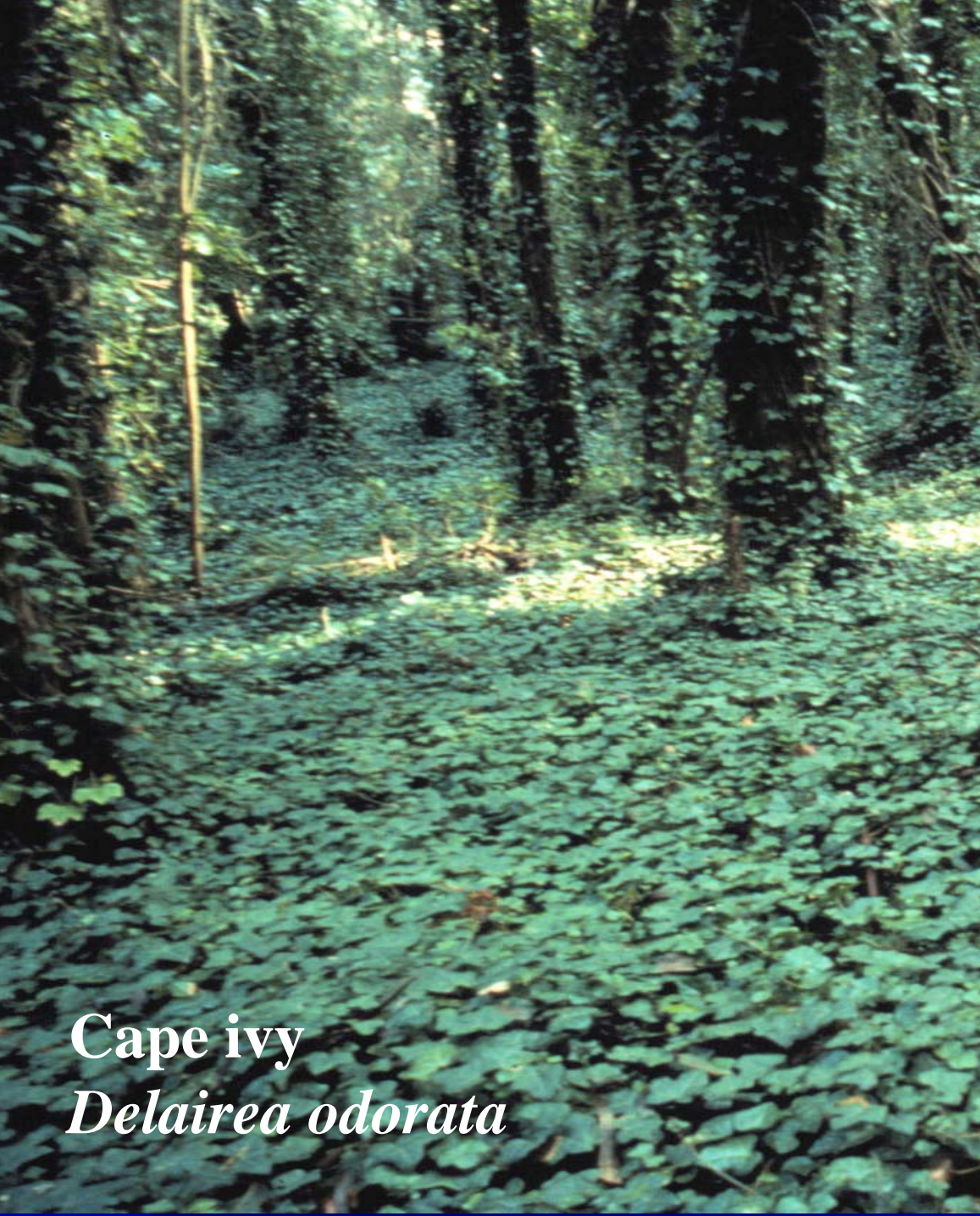


# Medusahead

(*Taeniatherum caput-medusae*)







Cape ivy  
*Delairea odorata*







Saltcedar  
*Tamarix ramosissima*





# Why do so many ornamentals escape?

## Ornamental Characteristics

- establish rapidly
- grow fast
- mature early
- abundant flowers
- environmentally fit
- free from major pests
- easy to propagate

## Weed Characteristics

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- prolific seeder
- environmentally fit
- free of natural herbivores and diseases
- abundant propagules



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# Many Invasive plants have a Horticultural Origin

- 85% of invasive woody plants in US introduced for ornamental trade
- 53% of California's most invasive plants are from the ornamental industry
- Potential exists for introduction of >1000 more invasive plants

# Wholesale Nursery Survey

- Survey looking at invasive species availability in CA wholesale nurseries
- Looked for 52 plants that were identified as being invasive in CA
- Of the 25 wholesalers surveyed
  - 18 carried at least one invasive plant
  - On average each wholesaler carried 3.2 invasive plants (one carried 14)!
  - Of the 52 plants on the list, 32 were carried by at least one wholesaler



# Wholesale Nursery Survey

- Plants most widely available:
  - Fountain grass / *Pennisetum setaceum* (12 of 25)
  - English Ivy / *Hedera helix* (7 of 25)
  - Periwinkle / *Vinca major* (7 of 25)
  - Pampas grass / *Cortaderia selloana* (5 of 25)
  - Cotoneaster / *Cotoneaster lacteus* (5 of 25)
  - CA Pepper tree or Peruvian pepper tree (5 of 25)

# Retail Nursery Survey

- UC Master Gardeners conducted a survey on retail nurseries
- Visited 23 nurseries looking for 25 invasive plants
  - Found 23 of the 25 on sale
  - Top 5 sold
    1. English Ivy (23 of 23)
    2. Fountain grass (21 of 23)
    3. Periwinkle (21 of 23)
    4. Red Apple (19 of 23)
    5. Licorice plant (17 of 23)



# California's Horticulture Industry

- Third largest agriculture industry in the state
  - \$14 billion per year
  - Produces 21% of nursery plants nationwide
- Gardening is the most popular active pastime in North America

# Prevention

- Monitor pathways of introduction
  - nurseries, hay, soil movement, animals, equipment, vehicles
- Screening process for evaluating new intentionally introduced species
- Identify and regulate pathways for unintentional introductions
- Identify species that have a high likelihood of being accidentally introduced



# Prevention

- Susceptible landscapes
  - Rangeland & forest management, succession following fire, soil disturbance
- Education programs
- Detection and monitoring
  - be aware of neighboring infestations

# Early Detection & Rapid Response

- Key Elements to Success
  - Up-to-date scientific and management information
  - Rapid and accurate species id.
  - Rapid risk assessment
  - Mechanisms for coordinating efforts
  - Adequate technical assistance
  - Stable funding for emergency efforts